A critical appraisal of "Effectiveness and cost-effectiveness of neuromuscular exercise and back care counseling in female healthcare workers with recurrent non-specific low back pain: a blinded four-arm randomized controlled trial"

By

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Abstract

Low back pain is a common injury for nurses and physical therapists, two professions that involve large loads being placed on the lumbar spine during patient transfers and lifting maneuvers. Unfortunately, scant research has been done into the role that therapeutic exercise may play in reducing low back pain. The article being reviewed sought to answer the question of "In workers suffering from job-related low back pain, are therapeutic exercises effective in reducing pain?". Through a randomized controlled trial consisting of four different groups, (lifting form counseling only, therapeutic exercise only, combined counseling and exercise, and control) the authors found that therapeutic exercises alone are not effective in reducing low back pain. Unfortunately, the authors' lack of transparency undermined the credibility of this claim. By not including the specific exercise program that was administered, the authors failed to make the experiment replicable by a broader audience. Also, by not taking any measurements of low back pain prior to six months of treatment completed, the authors did not account for the possibility of a short-term decrease or increase in back pain to occur. When the authors do exercise transparency, the reader learns that 10.5% of subjects in the therapeutic exercise only group completed zero exercise sessions, likely skewing the results towards therapeutic exercise not being effective. Therefore, the study fails to create a compelling or credible addition to current low back pain treatment literature.

Key words

Low back pain, therapeutic exercise, nursing, posture counseling

Introduction

Low back pain is one of the most common injuries that affects health care workers. At particularly high risk are nurses and physical therapists, two professions that involve large loads being placed on the lumbar spine during patient transfers and lifting maneuvers. These movements, when combined with poor lifting posture, place extreme pressure on the spine and can lead to low back pain. Once low back pain occurs, recovery is often a tedious process, with few, if any, timely solutions to resolve symptoms. With a dearth of health care workers in the United States, it is imperative that workers who become injured return to full health as soon as possible. Therefore, research must be conducted to find the methods that are most conducive to a rapid return to work. Through this critical appraisal, insight will be gained into the effectiveness of three different approaches to resolve low back pain: therapeutic exercises, lifting form counseling, or a combination of both methods. From this insight, the question of "In workers suffering from job-related low back pain, are therapeutic exercises effective in reducing pain?" will be answered.

Methods

Pubmed and CINAHL were the two databases used for research. The search used to gather results was: "Low back pain" AND "workplace" AND "exercise." During the Pubmed search, article type was limited to "randomized controlled trial" to ensure that only the highest quality evidence was found. CINAHL did not offer an article type filter, so "exercise" was selected under the "subject: major heading" filter to ensure that only articles predominantly focused on exercise were included. Often, therapeutic exercises were combined with stretching or

cardiovascular activity to form a holistic exercise program. These searches were excluded as the clinical question was interested in only the effects of therapeutic exercise. Under these criteria, Pubmed returned eight results that were considered suitable for review, while CINAHL returned eleven.

The article was published in the journal BMC Public Health in 2018. The authors were Jaana Helena Suni, Päivi Kolu, Kari Tokola, Jani Raitanen, Marjo Rinne, Annika Taulaniemi, Jari Parkkari and Markku Kankaanpää. The results were gathered from hospital workers in Tampere, Finland. The article was chosen for two reasons. One, the article was one of three where therapeutic exercises were a stand-alone intervention. Two, the article also introduced an interesting concept of posture and lifting counseling. The idea of resolving low back pain simply by correcting body mechanics was an intriguing concept to explore.

Results

Summary of the study

Many female healthcare workers suffer from low back pain because of the frequent bending and lifting components of their jobs. The purpose of this study was to perform a randomized clinical trial to find the effectiveness and cost-effectiveness of different interventions on low back pain: therapeutic exercise or back care counselling or a combination of the two. Workers were randomly assigned into one of the four groups (exercise, counselling, exercise and counselling, or control) and then based on grouping, given a series of exercises to perform for 60 minutes, twice a week for 24 weeks or received counselling on avoiding harmful loading strategies for the lower back. Participants measured pain on a visual analog scale, ranging from 0-100 mm, at the beginning of the 24-week period and again at the end. Intensity of LBP only decreased

significantly in the combined exercise and counselling group (p-value 0.006), whereas exercise alone had no significant difference compared to control. The authors concluded that therapeutic exercises once a week for 24 weeks combined with five sessions of back care counseling would be effective for reducing low back pain in female healthcare workers. However, therapeutic exercises alone would not be effective.

Appraisal of the study introduction

The study introduction does an excellent job of recognizing that effects of low back pain are numerous and not simply limited to pain. Other effects encountered include increased fear avoidance behaviors and a decreased quality of life. In addition, the literature that the authors use is current and appears in reputable journals.

The weaknesses of the introduction are multiple. There is a sentence stating, “multidisciplinary rehabilitation is better than usual care,” but there is no further statement to identify what “usual care” for low back pain is. The authors should quantify what “usual care” entails and how they concluded that it is the norm. There is also discussion about contributors to acute low back pain in nurses, such as lifting and transferring patients, but there is no discussion about contributors to chronic low back pain. The causes of chronic low back pain should be investigated further.

Appraisal of the study methods

The two positives for the study methods were the study being a randomized controlled trial and obtaining a subject pool of uniform characteristics (Age, BMI, and pain intensity).

Unfortunately, the authors’ methods left lots of room for improvement. Only three measurements of pain intensity were taken: baseline, at six months, and at twelve months. When the authors

take no pain measurements before six months, it is impossible to tell if a full six months of treatment is necessary or if the same benefits would have been acquired after, say, three months of treatment. Additionally, the exact therapeutic exercise program that the subjects underwent is not included in the article. Therefore, the study is not replicable.

Appraisal of the study results

The result section is written in a clear and organized manner. The first question that was asked in the introduction regarded the effectiveness of the interventions. The second question that was asked regarded the cost-effectiveness of the interventions. The results were presented in the same order that these questions were asked. The results section also succeeds in making the percentage change in low back pain from baseline easily comprehensible through color-coded graphs with a legend.

Figure 2 detracts from the clarity of the preceding figures and tables. There are 3 interventions being undertaken: exercise and counseling, exercise only, and counseling only. However, Figure 2 only presents p-values for the combined group for all 3 outcome measures. P-values for exercise only and counseling only should be added. Additionally, there are two different p-values given, adjusted and crude. There is no reasoning given for why the p-value is adjusted or what the adjustment is. The reader would be helped immensely if the reasoning were added.

Appraisal of the study discussion

The authors did a good job of tying their findings to existing literature. For example, multiple articles were listed that involved a decrease in fear avoidance behaviors but not a decrease in low back pain after an exercise program. The authors did their research and came up with a new

intervention (exercise and counseling rather than exercise alone) that could cause a significant decrease in low back pain only.

Unfortunately, the authors performed poorly when indicating the meaning of their findings and instead resorted to repeating the results. Much of the discussion revolved around the strength and weaknesses of the study design rather than interpreting the results. Therefore, the authors failed to provide any future study possibilities.

Discussion

Physical therapists may find this study helpful because it suggests that there is multifactorial solution to back pain and strengthening exercises alone will not cure it. Patients should understand that the solution will be complex and lengthy as opposed to a short, quick fix. Additionally, the study serves to answer the clinical question by concluding that therapeutic exercises alone do not cause a significant decrease in low back pain amongst health care workers.

The intervention appraised does not seem to be a timely or effective manner of reducing low back pain. At the six-month mark, there was no significant decrease in low back pain. Very few patients will be willing to wait six months to start seeing results for an injury that heavily impacts their day to day life. There appears to be no tangible benefit to using the only therapeutic exercise intervention in the clinic. However, something that could reduce the argument against using the intervention would be if the authors had provided a three month check in and found that there was a significant decrease in pain, even though the significant decrease disappeared by the six month mark.

I do not have confidence in the research validity to use the evidence with my client. First, the exercise program the authors used was not included in the article. Therefore, I would be unable to replicate the exact conditions for a patient under my care. Additionally, the 30% dropout rate leads to many questions about research validity. Were the patients dropping out because they were satisfied with the results they were seeing or dissatisfied? If the patients were dissatisfied, the exercise routine is viewed much more negatively and should be changed. However, the intervention could be safely implemented in a clinical setting in the future. Therapeutic exercises are very common to physical therapy curriculum and a routine purely for lower back pain relief could be generated with ease.

In conclusion, this appraisal finds that therapeutic exercises alone do not result in a significant decrease in low back pain. On a critical level, the exclusion of p-values of the test conditions and the workout routine the patients underwent, as well as a 30% dropout rate all decrease the credibility of the work. Therefore, the study has limited generalizability and fails to create a compelling addition to research of treatments for low back pain.